

The WSDOT Cost Estimate Validation Process®

Risk Based Estimating at WSDOT

CRA and CEVP®

Mark Gabel

Cost Risk and Estimating Management

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**Washington State
Department of Transportation**

CEVP/Cost Risk Assessment – History

2002 - WSDOT begins working in earnest on a new process to better estimate costs of complex transportation projects. The process came to be known as “Cost Estimate and Validation Process, CEVP®.

2003 - First round of CEVPS conducted around the state on 12 Mega Projects.

2003 - A simpler version of cost risk evaluation was used for projects in Northwest Region, it was a one–day “due-diligence” review of smaller projects, referred to as “Schedule Cost Risk Evaluation” or “SCoRE” (SCoRE is no longer in use).

2003 - Cost Risk Assessment Workshops are used statewide on projects not large or complex enough to warrant a full CEVP. · 2003 - WSDOT Cost Risk Estimating Management Office is established.

2004 - CEVPs of Major projects were updated

CEVP/Cost Risk Assessment – Today

2005 – Summer: Project Management On-Line Guide deployed with Executive Order. Risk Management Planning is a key component in the Project Management Work Planning process.

2005 – Summer: A Policy for Cost Risk Assessment, including use of CRAs and/or CEVPs, established statewide.

2005 – Fall: A Risk Management Plan spreadsheet tool is made available on our website and provides a convenient tool for risk management planning and measuring performance of risk management efforts.

2006 – Currently: Exploring development of portfolio risk modeling tool; exploring development of risk database; exploring ways to increase the efficiency and effectiveness of CEVP®. Enjoying the 2006 TRB conference!

“Yol Bolsun”

“May there be a road!”

*Louis L'Amour - 'The Walking Drum'

*NOTE: Yol Bolsun was a toast that meant “May there be a road” according to Louis L'Amour in his book “The Walking Drum”.

...for the price we said

and

...when we said

OUTLINE

- I. Getting control of cost overruns and project delays**
- II. WSDOT Project Management On-Line Guide**
- III. Project Estimating (Cost and Schedule) – Risk Based Approach**
- IV. Results**
- V. Next Steps**

Terminology

Stochastic, risk based, cost risk assessment, CEVP[®] generally refer to the notion of probabilistic estimates that consider uncertainty and variability

Parametric estimating generally refers to the use of relationships between a project's known characteristics and known historical references for same or similar projects and project elements.

Deterministic estimating generally refers to “single-point” estimates that more or less directly measure the items being estimated.

Doug MacDonald's Edict

**“Project Delivery and Accountability”
 (“On time... on budget!”)**

The MacDonald Mantra

**“What gets measured...
 gets managed.”**

The Questions

- How much will it cost?
- How long will it take?

The Follow-up Questions

- Why does it cost that much?
- Why does it take that long?

The Answer

An Estimate is not a number

- Projects are subject to many variables that cannot all be known beforehand.
- Cost and schedule estimates represent one possible outcome of multiple variables.
- These variables are not all directly controllable or absolutely quantifiable.
- Therefore cost and schedule estimating and the validation process must consider probabilities in assessing estimates and schedules, using a recognized, logical and tested process.

The Answer continued...

... and an Estimate is still just an Estimate.

Estimate

...to judge tentatively or approximately: to determine roughly the size, extent...
to produce a statement of the approximate cost. Implies a judgment, considered or casual, that precedes or takes the place of actual measuring...

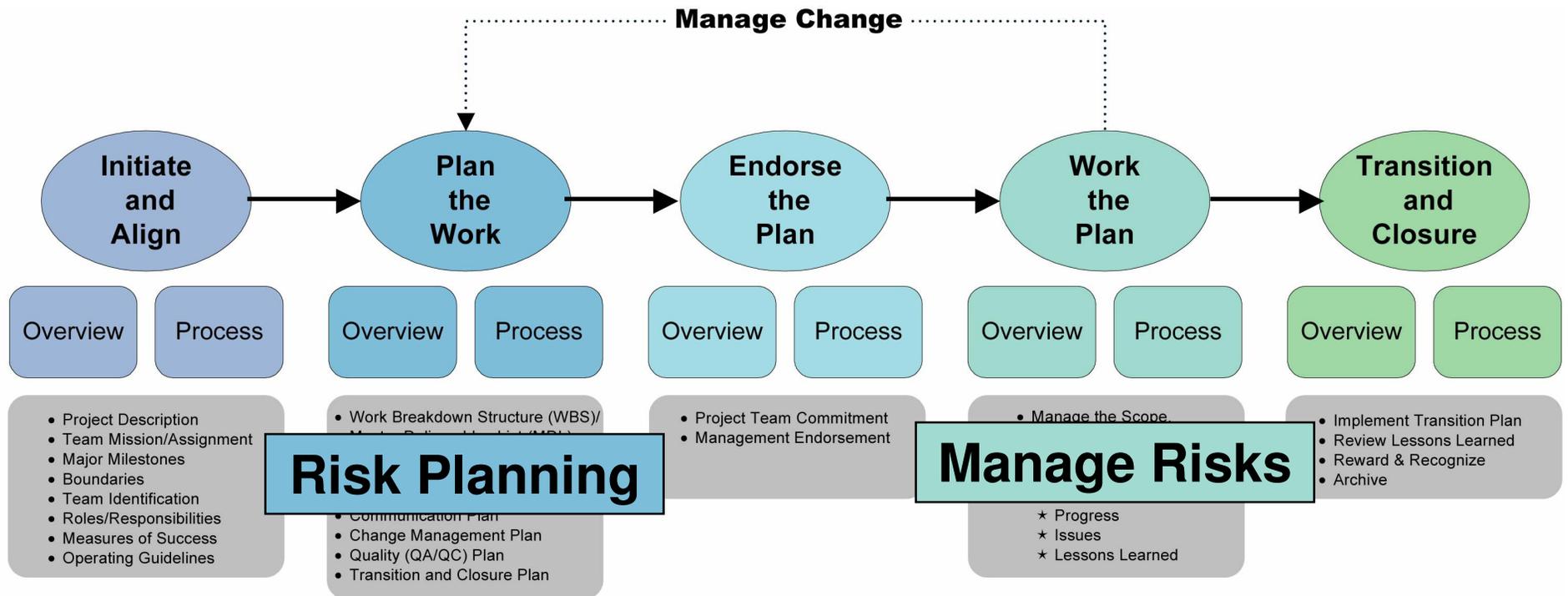
Assess

...implies a critical appraisal for the purpose of understanding or interpreting, or as a guide in taking action.

Project Risk Management . . .

“describes the processes concerned with conducting risk management on a project.”

PMBOK



***Project RISK Management* PLANNING**

- **Risk Identification**
- **Qualitative Risk Analysis**
- **Quantitative Risk Analysis**
- Risk Response Strategy
- Risk Monitoring & Control



Risk Based Estimating at WSDOT

Cost Risk Assessment and Cost Estimate Validation Process
CRA and CEVP[®]

Pre Workshop Activities	Workshop	Post Workshop Activities
<ul style="list-style-type: none">• Prep with Project Team• Prep with Risk/Cost Leads• Project Flowchart	<ul style="list-style-type: none">• Project Info• Cost Validation• Risk Elicitation	<ul style="list-style-type: none">• Model Built• Draft Report• Final Report and One Pager• Risk Management Plan

Principles

First: VALIDATE

Avoid false precision; as big a problem as “early optimism.”

NOTE: Approximately right is better than precisely wrong.

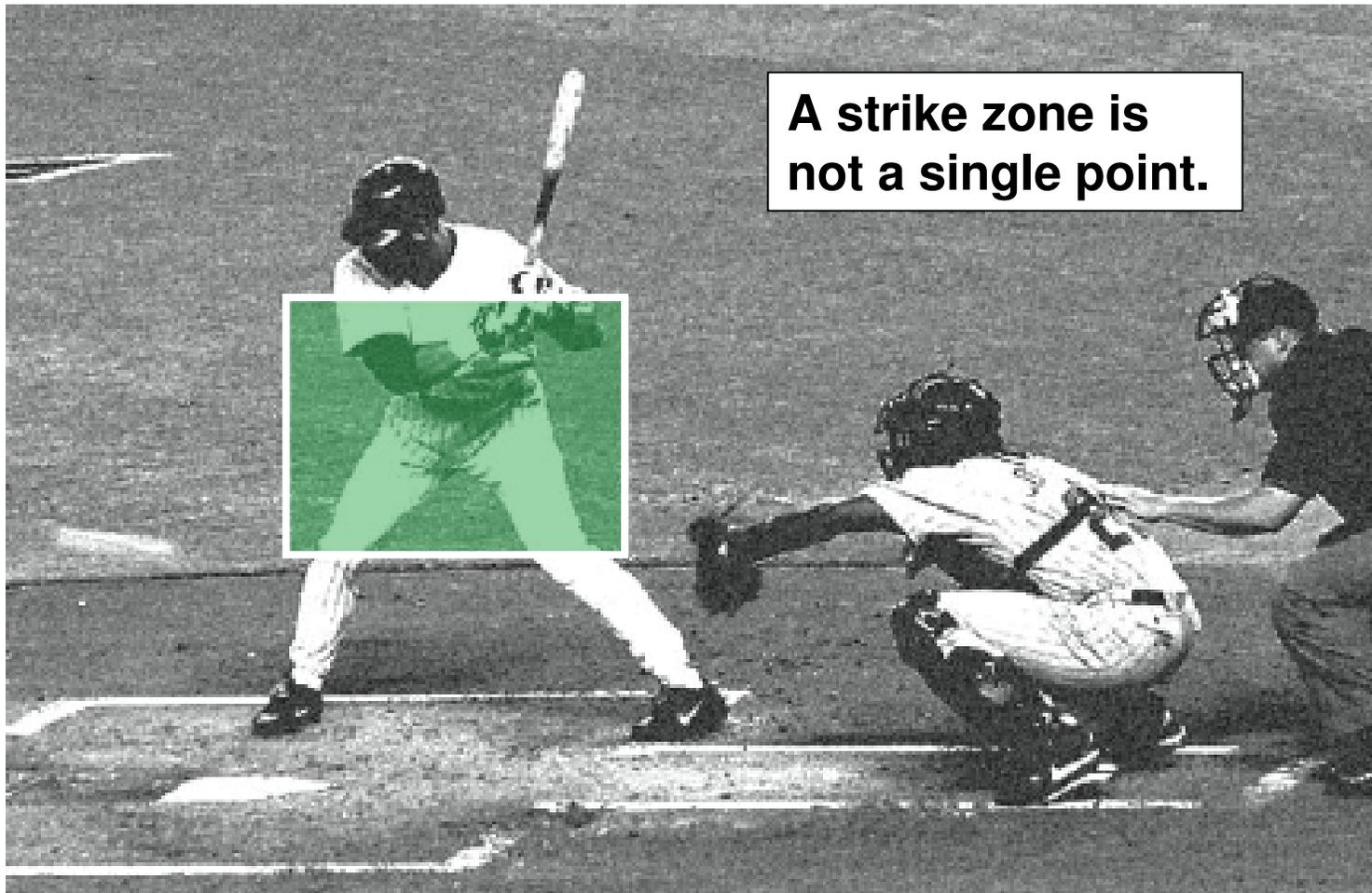
Second: COMMUNICATE

Relate “contingency” to everyday experiences with uncertainty.

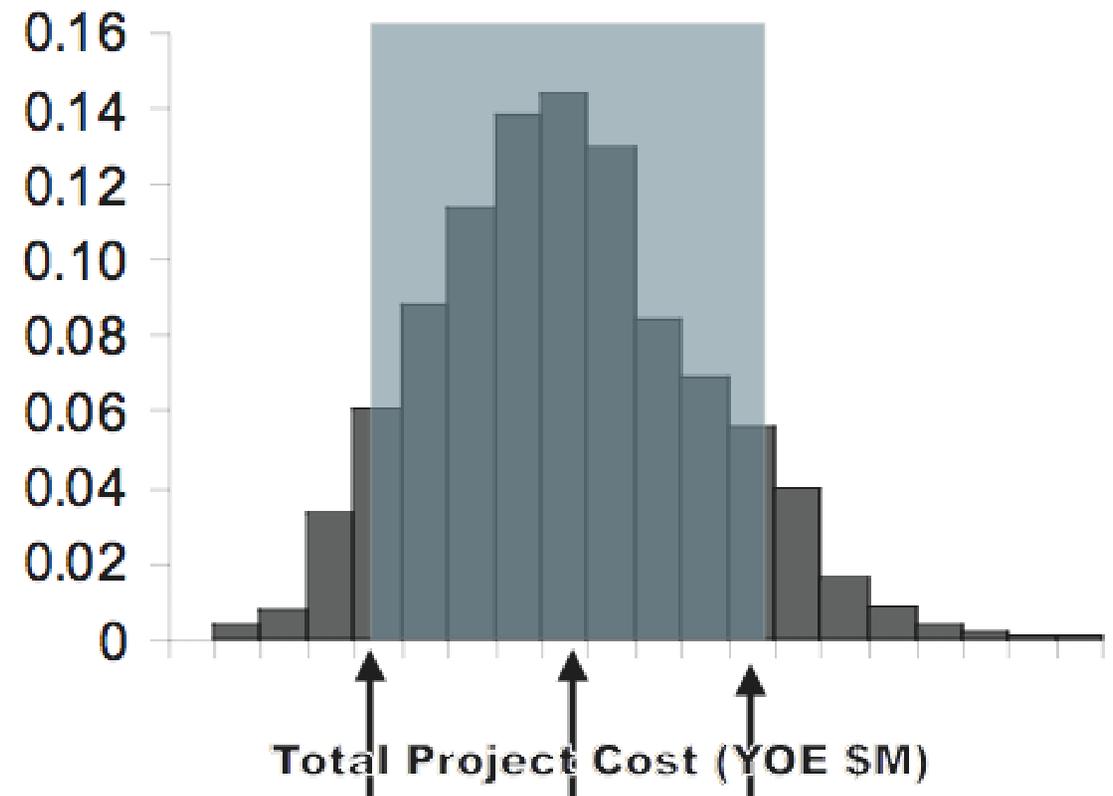
Third: IMPROVE

Invest in continuous and transparent qa/qc of your actual cost estimating process.

A strike can be in the high or low range of the strike zone, and it can be near the inside or outside of the plate.



...an estimate has a high and low range.



10% chance the cost <\$861 Million

50% chance the cost <\$896 Million

90% chance the cost <\$937 Million

These simple management strategies underlay WSDOT's investment in CEVP®

- Avoid “single number” estimates at all events.
- Cause intensive, peer-rich, collaborative scrutiny of project base cost estimating and assumptions.
- Ideally should be doing CEVP® prior to building our book of estimates for the legislature.
- Building budgets in ranges would be even better... Decision makers should agree on what confidence level to use for budgeting. Typically our project offices are using the 90% confidence number.
- Inspire a different character of media/public engagement.
- Emphasize common sense notions of risk description and quantification. People can relate to...Home improvement projects, Mortgage fees, Car loans (basic Chevy vs Cadillac)

74 Workshops Total

(2002 – present)

35 CEVP®

39 CRA

Qualitative Results

- Improved communication with the public.
- Improved team communication.
- Project Managers take action pro-actively to avoid, transfer or mitigate risk.
- Risks that are accepted are known.
- Risk Management Plans are integral component of project work plans.
- Potential response strategies, especially pro-active measures, are identified in the workshop.

Quantitative Results

First ten projects to go through CEVP ®

- Process hallmark is collaboration of WSDOT project teams and the consultant team (subject matter experts, cost and risk experts)
- Formal Reports Prepared
- Cost = \$1.5 million (< 0.01% of total project costs)

Other Points of Interest

Project Engineers/Managers have indicated...

- “One-pagers” are very popular
- Risk register useful for project planning
- Cost and schedule validation an important feature
- Find the expert review very valuable
- The process is scalable

CHALLENGES

- Quantifying and measuring accuracy/performance of CEVP[®] results and risk management efforts.
- Tracking schedule and cost estimates as the project evolves and changes.
- Maintaining consistency in workshop process while providing the flexibility required to deal with each project on an individual basis.

Next Steps

- Risk Management Plans for all of our projects
- Investigate Risk Based Estimating for Portfolios/Programs
- Develop Risk Database(s)
- Improve monitoring and quantification of results
- More fully develop performance measures.
- Make the process even more scalable.
- Explore the use of risk reserves.

Thank-you for your interest.

What are your questions?

"We have, perhaps too often, taken a best case scenario and then committed to delivering on it, when in order to deliver on it, we have to have seven or eight miracles occur. We're going to be a lot more deliberate and a lot more careful about what we say we can do at what cost and when we can do it."

*-U.S. Deputy Energy Secretary Bruce Carnes on Hanford,
July 2005*